Adithya A Rao

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Research Interest

My interests lie in Theoretical High Energy Physics, Physics beyond Standard Model, Quantum Mechanics, Gravity; while I am intrigued by the unsolved problems like quantum gravity, matter-antimatter asymmetry, anomalous mass of neutrino etc.

Education

- **5 years Integrated M.Sc in Physics**

  Sardar Vallabhbhai National Institute of Technology, Surat
  July 2019 - present
  CGPA upto 5th (previous) semester - 9.64

- **12th (Intermediate)**

  Karnataka State Board of Pre University Education
  Jnanaganga PU College, Nellikatte Moodubelle, Udupi
  June 2017 - March 2019
  Percentage - 97.5%

- **10th (High School)**

  CBSE
  St. Mary's English School, Kannarpady, Udupi
  March 2017
  CGPA - 10

Research Experience

- **Institute mini project II on**
  Magnetic Monopoles
  [Jan 2021 -] (Ongoing)

  Abstract: Magnetic monopoles do not exist in nature, but the entire electrodynamics cries for its existence. This project includes a study of the effects of existence of monopoles on Maxwell's electrodynamics, and also search for methods to realize monopoles without disturbing the vector potential.

- **Institute mini project I on**
  Dynamical Symmetries of the Kepler System
  [Aug 2021 - Dec 2021]

  Abstract: A study of the SO(4) symmetry group of the Kepler system, with an understanding of the origin of the six generators of the system, group actions and also possible applications in the Hydrogen system.

- **Neutrino Oscillations**
  [June 2021 - Dec 2021] (Ongoing)

  Supervisor : Dr. Srubabati Goswami, Senior Professor,
  Physical Research Laboratory (PRL), Ahmedabad.

  Abstract: A study of the vacuum and matter oscillation phenomenon in neutrinos, owing to energy eigenstates not being same as flavour eigenstates, and its connections to the solar neutrino problem, while also addressing the question of why charged leptons do not oscillate.

- **Statistical and Thermodynamic properties of Quark Gluon Plasma**
  [May 2021 - July 2021]

  Supervisor : Dr. Arvind Kumar, Assistant Professor,
  Department of Physics, NIT Jalandhar.

  Abstract : Quark Gluon plasma is hypothesised to have existed in the first few instants after the creation of the universe in the Big Bang. This project is a study of the statistical properties of the quark gluon plasma and a crude determination of the phase boundaries, while also addressing the question of the possibility of producing quark gluon plasma in laboratory.

Relevent Coursework

- **University Offered Courses:**
  Classical Mechanics, Introductory Quantum mechanics, Kinetic theory and Thermodynamics, Electrodynamics,
  Partial Differentiation, Ordinary Differential Equations, Vector Calculus, Laplace transform, Fourier series, Fourier transform, Complex variables, Computational and numerical methods.

- **Self Studied Topics**
  Quantum mechanics, Group theory and Lie algebra, Special Relativity and Introductory General relativity, Statistical Mechanics, Basics of Particle Physics, Linear Algebra.

Technical Skills

- **Programming Languages:**
  - Beginner: Fortran, Javascript, LabVIEW
  - Intermediate: C, C++, Python, Matlab

- **Softwares:** Wolfram Mathematica, LaTeX, Microsoft Office
- **Operating Systems:** Windows, Linux

Achievements

Fellow of INSPIRE fellowship award, funded by Department of Science and Technology, Govt. of India, awarded to top students of the country for pursuing higher education and research in pure sciences.

Positions and Responsibilites

- **Member, Physics Club of NIT Surat**, a club actively conducting events to impart knowledge and inculcate the interest for physics.
- **Author, thehavok.com**, aiming at making science writing a more concise way to learn, even for a beginner to the world of science.

References

Can be provided on demand.